

CLAIMS

1. A catalyst composition for the preparation of oligomeric derivatives of olefin monomers, comprising a Group 6 metal amide complex or compound, a Group 1, 2, 12, 13 or 14 metal hydrocarbyl composition or compound, and a solid support comprising aluminum phosphate.
2. The catalyst composition of claim 1 wherein the Group 6 metal amide complex corresponds to the following formula: $M(NR^1)_2X_{v-r}$ wherein M is a Group 6 metal;
 R^1 independently in each occurrence is a secondary or tertiary alkyl group of from 3 to 20 carbons, a cycloalkyl group of from 5 to 20 carbons, an aryl or alkylaryl group of from 6 to 20 carbons, or a tri(C_{1-20})hydrocarbylsilyl group, and optionally two R^1 groups on the same or adjacent amide groups may be joined together thereby forming a heterocycloaliphatic ring, or an alkyl-, aryl-, cycloalkyl-, or trihydrocarbylsilyl- substituted derivative thereof;
X is an anionic ligand of up to 20 atoms not counting hydrogen, and optionally one or more X groups and/or one or more NR^1_2 groups may be joined together to form an aliphatic or aromatic ring,
r is a number greater than 0 and less than or equal to v, and
v is the valence of M.
3. The catalyst composition of claim 1 wherein the metal hydrocarbyl composition or compound is trimethylaluminum, triethylaluminum, or tri-isobutylaluminum.
4. The catalyst composition of claim 2 wherein the metal hydrocarbyl composition or compound is trimethylaluminum, triethylaluminum, or tri-isobutylaluminum.
5. The catalyst composition of claim 1 wherein the aluminum phosphate is substantially amorphous and corresponds to the formula: $Al_xP_yO_4$ where $x+y=2$ and x is > 0.2 .
6. The catalyst composition of claim 5 wherein the aluminum phosphate has a P/Al molar ratio from 0.92 to 1.0.
7. A process for the preparation of oligomeric derivatives of olefin monomers, comprising contacting an olefin monomer or a mixture of olefin monomers under oligomer formation conditions with a catalyst composition according to claim 1.
8. The process of claim 7 wherein the olefin monomer is ethylene.
9. A process for the catalytic oligomerization of ethylene to yield a mixture comprising a Poisson distribution of 1-hexene and 1-octene products characterized in that the catalyst composition comprises a Group 6 metal amide complex or compound, a Group 1, 2, 12, 13 or 14 metal hydrocarbyl composition or compound, and a solid support comprising aluminum phosphate.

10. The process of claim 9 wherein the α -olefin product mixture comprises greater than 10 percent 1-octene and less than 90 percent 1-hexene, with less than 10 percent of all other α -olefin reaction products, and optionally polymer.

5 11. A process for preparing copolymers of ethylene and one or more C_{4-8} α -olefins by the direct α -olefin formation and polymerization of ethylene comprising contacting ethylene under oligomer formation conditions with a catalyst composition according to claim 1 and polymerizing at least a portion of the resulting oligomers.

12. A process according to claim 11 in which the ethylene source is recycle of monomer in an ethylene polymerization process.

10 13. A process according to claim 11 wherein a mixture of catalyst compositions or a second olefin polymerization catalyst is employed.